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Consumer Preference for Beef In Relation to Finish

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This bulletin reports on projects in the departments of Animal Husbandry, Agricultural Economics, and Home Economics RM-II-31, entitled, "Consumer Acceptance of Meat and Meat Products."

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INTRODUCTION

Interest in studying consumer preferences for agricultural commodities has increased in recent years. Much of the early interest centered on type and size of packaging and method of display. Currently, more emphasis is being placed on observing consumer preferences with respect to inherent qualities of the product itself.

Many believe that the problem of producing what consumers prefer is the central one in the marketing of farm products. It is recognized that the basic product can, only with difficulty, be disassociated from packaging materials, type of service rendered in available retail outlets, and a host of other factors. Also, there is increasing awareness that products are modifiable in various ways.

In this context, production of the "basic product" and the increments to the product in the form of packaging and services must be separated in the study of marketing. In the marketing of farm products where the channels of marketing are long and complicated, preferences for the "basic product" may become submerged. Prices in the retail markets of finished products provide an inadequate guide in reflecting the desires of consumers for the "basic product."

It is a reasonable assumption that the desires of consumers with respect to "basic product" are being transmitted inadequately to producers and to the various marketing agencies. If this assumption is true, failure may be due to several factors. Basic among them probably is the general lack of knowledge among and between consumers and producers. Among consumers there may be a lack of knowledge about the best or optimum use of the products available to them. Producers may not be cognizant of the desires of consumers and hence fail to produce those types of goods and services that would maximize satisfaction. Producers may not recognize basic shifts in overall consumer preferences associated with increasing urbanization of society. Increased understanding and knowledge on the part of all the participants in production and consumption would contribute to greater overall economic efficiency.

Concern has been expressed by representatives of the meat industry that many consumers lack knowledge that would enable them to recognize and purchase beef of the grade or the quality they prefer. This is a matter of

increasing importance with the trend toward self-service, fresh meat merchandising. The butcher under this procedure has practically no personal contact with customers. The housewife therefore must make her meat selections without advice and guidance from the butcher.

Federal or packer grade and store brand identification of fresh beef have not provided sufficient guides to consumers in making selections of beef at retail stores. Grade and brand identification attempts to divide the quality of meats of a given class into groups of similar and uniform quality. Grade terms have generally been used in the wholesale trade. Wholesale grade identification, however, usually is not carried forward to the retail stores.

A major problem exists in the area of identification of fresh beef cuts in facilitating choices that would tend to promote greater and more consistent satisfaction. Under the usual situation, the consumer must make an evaluation of the visible characteristics of the meat as it appears in the display case and relate these to ultimate eating satisfaction. It would appear that a study of those factors that consumers believe important in selecting beef cuts would contribute an understanding of the nature of problems associated with preferences for beef. An analysis of the preferences for the "basic product," beef, would also serve as a guide to orienting production of beef that would insure greater consumer satisfaction.

SCOPE AND METHOD OF STUDY

The objectives of the study were:

1. To evaluate consumer preference for amount of fat in beef
2. To determine the criteria which consumers use in selecting beef
3. To relate preferences at time of purchase to those at the time of eating
4. To relate consumer income to preferences

The design and procedures used were in the nature of a pilot scale investigation of the factors and relationships involved, as stated in the objectives. In planning the design and the procedures of this study, it was recognized that several important problems would be encountered. One major problem was that of obtaining and interpreting attitudes concerning preferences of consumers and especially of those consumers who had little knowledge regarding meat selection. The small sample of consumers selected was to serve as a basis for appraisal of procedures so that improvements in design could be made for future studies.

The general operational plan of the study was as follows:

1. Certain retail beef cuts were made available at the University Meats Laboratory.
2. Fifty cooperators were chosen who selected and purchased retail cuts from a display composed of various grades of beef.

3. Following purchase, each cooperator was interviewed. The interview schedule obtained information on factors they considered in making selections.

4. A second interview which was taken in the home of each cooperator obtained further information on preferences following the consumption of the meat purchased.

The data were collected during March and April, 1952. Those participating in the study were asked to purchase meat at the University Meats Laboratory at weekly intervals on four separate dates. The dates were March 14, 21, 28, and April 4. A preliminary experiment was conducted on November 10 and 17, 1951, for the purpose of discovering operational problems in organizing this type of study.

Sample of Cooperators. An effort was made to obtain a representative sample of 50 consumers in Columbia, Missouri. Each family in the sample was contacted by personal interview to explain the nature of the participation in the study. Most of those contacted consented to cooperate but some, particularly those of the lower income groups, did not participate for various reasons. (Table 1.)

TABLE 1 -- NUMBER OF COOPERATORS PARTICIPATING ON EACH OF THE FOUR SURVEY SALE DATES, MISSOURI, MARCH & APRIL, 1952

Survey Sale Date	Cooperators Participating	
	Number	Percent
March 14	48	24.5
March 21	41	20.9
March 28	49	25.0
April 4	58	29.6

It was hoped that all of the 50 cooperators would participate on each of the four dates. Only 18 cooperators participated on all four dates. When some did not appear on the second date, selections for additional cooperators were made from a list of alternates. Consequently, there were 92 individual cooperators participating in the study, some of whom participated only once. (Table 2.)

TABLE 2 -- COOPERATORS PARTICIPATING ON ONE OR MORE OF THE RESPECTIVE SURVEY DATES, MISSOURI, MARCH & APRIL, 1952

Times Participating	No. of Cooperators Participating	Percent of Total Number Participating
1	38	41.3
2	22	23.9
3	14	15.2
4	18	19.6
Total	92	100.0

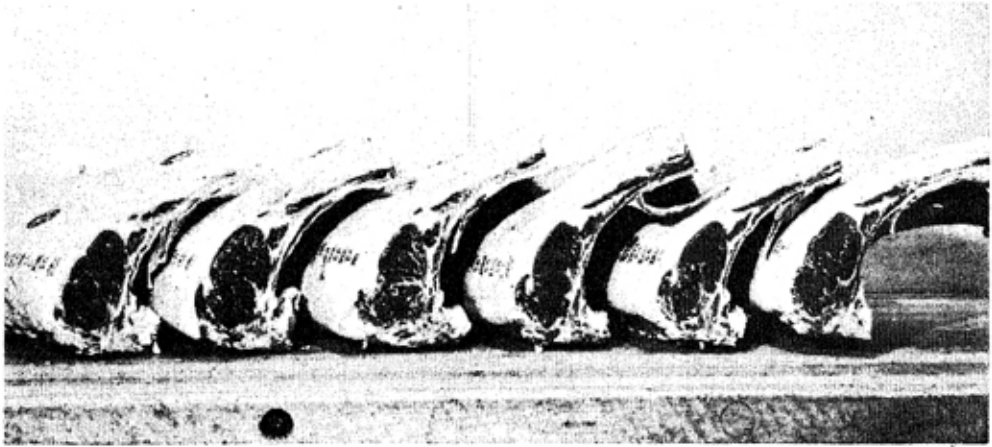


Fig. 1—Prime (left) and Choice (right) wholesale ribs selected for the study.

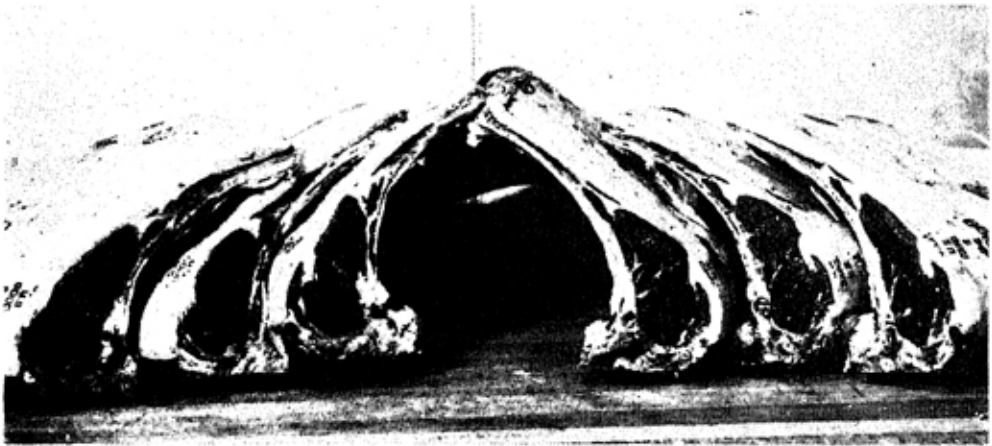


Fig. 2—Good (left) and Commercial (right) wholesale ribs selected for the study.

Prime	Good	Choice	Commercial
Good	Commercial	Prime	Choice
Choice	Prime	Commercial	Good
Commercial	Choice	Good	Prime

Fig. 3—Arrangement for displaying steaks and roasts, March and April, 1952.

Meat Cuts Used and Meat Display. Wholesale rib cuts from steer carcasses of the grades U. S. Prime, Choice, Good, and Commercial were purchased. Selections of these cuts were made by representatives of the University Meats Laboratory along with a federal grader. Care was exercised to select wholesale cuts as far as possible from carcasses of the same age and weight.

Steaks were cut $\frac{3}{4}$ inch thick. Steaks with external fat in excess of $\frac{1}{2}$ inch were trimmed to $\frac{1}{2}$ inch. Roasts from the rib were cut to average about 4 pounds each. The average weights of rib end steaks prepared for the study ranged from $13\frac{3}{4}$ ounces to 1 pound $1\frac{1}{4}$ ounces. The average weight of loin end steaks ranged from $11\frac{3}{4}$ ounces to 13 ounces. The range in average weight of roasts was from 3 pounds $13\frac{1}{2}$ ounces to 4 pounds $1\frac{3}{4}$ ounces. The steaks and roasts were packaged with backboard and 300 MSAT 80 cellophane. (Tables 3 and 4.)

TABLE 3 -- RANGE AND AVERAGE WEIGHT OF RIB STEAKS PREPARED FOR CONSUMER PREFERENCE BEEF SURVEY

Grade	Number Prepared	Range in Weight				Average Weight	
		oz.	to lb.	- oz.	lb.	- oz.	
Rib End							
Prime	135	12 $\frac{3}{4}$	to 1	- 7 $\frac{3}{4}$	1	1 $\frac{1}{4}$	
Choice	136	11	to 1	- 4 $\frac{1}{4}$		15	
Good	190	10	to 1	- 5 $\frac{1}{2}$		14 $\frac{3}{4}$	
Commercial	115	9 $\frac{1}{2}$	to 1	- 2		13 $\frac{3}{4}$	
Loin End							
Prime	104	9 $\frac{1}{2}$	to 1	- 2 $\frac{1}{2}$		13	
Choice	191	8 $\frac{1}{4}$	to 1	- 1 $\frac{3}{4}$		11 $\frac{3}{4}$	
Good	193	9	to 0	- 15 $\frac{3}{4}$		12 $\frac{1}{4}$	
Commercial	126	9	to 1	- 0		11 $\frac{3}{4}$	

TABLE 4 -- RANGE AND AVERAGE WEIGHT OF RIB ROASTS PREPARED FOR CONSUMER PREFERENCE BEEF SURVEY

Grade	Number Prepared	Range in Weight						Average Weight	
		lb.	- oz.	to lb.	- oz.	lb.	oz.		
Prime	48	2	- 14	to 4	- 12 $\frac{3}{4}$	4	1 $\frac{3}{4}$		
Good	72	3	- 0	to 4	- 13 $\frac{3}{4}$	3	13 $\frac{1}{2}$		
Choice	86	3	- 5 $\frac{1}{2}$	to 4	- 8 $\frac{3}{4}$	3	14 $\frac{1}{2}$		
Commercial	62	3	- 2 $\frac{1}{2}$	to 5	- 1 $\frac{1}{2}$	4	1 $\frac{1}{2}$		

The rib steaks and roasts were displayed for sale in a self service refrigerated case. The cuts on display were relatively uniform in size (shape, weight, and thickness). Steaks and roasts of each grade were arranged in the same position in the display during each of the four dates. Equal opportunity existed for the selection of each grade. Position and the factor of position in selection were constant throughout the study. (Figure 3.)

Each cooperator was permitted to select either or both steak and roast from the display. The prices for steaks and roasts, regardless of grade, were constant and at the prevailing retail price for the Commercial grade. The



Fig. 4—Prepackaged rib steaks and roasts in sales display.



Fig. 5—Interviewing a cooperator after she had made her selections from the display.

prices were 79 and 85 cents per pound for the steaks (the higher price being charged for those steaks cut from the loin end of the rib) and 69 cents per pound for the roasts. (Figure 4.)

Each cooperator was interviewed after he had made his selection. Each was interviewed again in the home after the meat had been prepared and eaten.¹ (Figure 5.)

ANALYSIS

In the general design of the study it was contemplated that approximately 50 individuals would participate on each of the four dates. The plan was for a modified consumer panel technique in which observations of the purchase behavior and other information would be obtained over a period of time. Failure to obtain continued cooperation from those initially selected introduced several problems in the analysis. Aggregating the information from all those participating regardless of the number of times they participated would give disproportionate weight to those who participated most often. A more serious aspect was that each aggregation would violate the principle of the independence of each observation in the analysis. The relatively low rate of cooperation thus necessitated changes in the type of analysis from that originally planned.

The analysis in this section is based on information obtained from persons either participating only once or, in the case of those appearing more than once, the information obtained in their initial appearance. Consequently, the major part of the analysis is based on the data from 92 individuals. A limited type of analysis follows, based on data obtained from the 18 who cooperated in the study on all four dates.

Since difficulty was encountered after the first date in maintaining the original sample, a number of individuals were selected as alternates and made their first appearance on the second or subsequent dates. Observation of several measures of household characteristics and income indicated that the alternates could not be used as substitutes in view of the relatively small sample. (Table 5.)

TABLE 5 -- NUMBER AND PERCENT OF COOPERATORS REPORTING FOR THE FIRST TIME ON EACH OF THE FOUR SURVEY DATES, MARCH & APRIL, 1952

Survey Sale Date	Cooperators Participating	
	Number	Percent
March 14	48	52.2
March 21	10	10.9
March 28	20	21.7
April 4	14	15.2
Total	92	100.0

¹Only selected portions of the home interview schedule were used in this analysis.

ANALYSIS OF BUYING BEHAVIOR

Steaks

Cooperators selected a larger proportion of the lower grades of steak even though price was constant. Of the total of 65 steaks² selected, 43.1 percent were Commercial and 27.7 percent Good compared to 7.7 percent and 21.5 percent for Prime and Choice, respectively. (Table 6.) This would indicate a modal preference on the part of cooperators for the lower grades, Commercial and Good, with a preference for Commercial over Good.

TABLE 6 -- THE NUMBER AND PERCENT OF EACH GRADE OF STEAK SELECTED BY COOPERATORS

Grade	Number Purchased	Percent
Prime	5	7.7
Choice	14	21.5
Good	18	27.7
Commercial	28	43.1
Total	65	100.0

Basis for Selection of Steaks. After cooperators had made their selections from the display, they were asked why they had selected that particular steak. They gave a wide variety of answers and most gave several reasons for their choice. It should be recognized that the terms used probably have different meanings for the cooperator as compared with the meat technologist. Also, in the interpretation of the reasons given for selection, it should be recognized that in the opinion of the respondent the particular cut was the most desirable with respect to the attributes mentioned. Amount of fat, color and marbling, were the attributes most frequently mentioned. (Table 7.)

These replies accounted for 40.1 percent of the total number of reasons given for selecting particular steaks. Other reasons mentioned were amount of lean, size of cut, proportion of fat to lean, appearance, and quantity of bone, in the order listed. These accounted for 35.1 percent of the total number of reasons given. A few replies of lesser importance were also given.

Some of the reasons were mentioned only a few times, making it difficult to make interpretations of them in relation to grades. Replies of respondents with respect to marbling appeared to be consistent with those generally expected in relation to grade. However, no mention was made of marbling by those who purchased the Prime grade. On the other hand, marbling apparently was a factor in selection by those who had chosen the Commercial grade.

Comparison of the reasons given for steak purchases indicated that the amount of fat was most important among the reasons for choosing Com-

²Each cooperator was permitted to purchase additional steaks of the same grade he had selected from the display.

TABLE 7 -- REASONS, ACCORDING TO GRADE PURCHASED, GIVEN BY COOPERATORS FOR SELECTING A PARTICULAR STEAK FROM THE DISPLAY

Reasons given by Respondents ^{1/}	Grade Purchased									
	Prime		Choice		Good		Commercial		Total Replies	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Amount of fat	2	40.0	3	21.4	6	33.3	11	39.3	22	14.0
Color, general	3	60.0	4	28.6	6	33.3	9	32.1	22	14.0
Marbling	-	---	7	50.0	7	38.8	5	17.8	19	12.1
Amount of lean	-	---	2	14.3	6	33.3	8	28.6	16	10.2
Size of cut	-	---	3	21.4	4	22.2	5	17.8	12	7.6
Proportion of fat to lean	1	20.0	3	21.4	3	16.6	3	10.7	10	6.4
Appearance	2	40.0	3	21.4	2	11.1	3	10.7	10	6.4
Quantity of bone	-	---	1	.7	2	11.1	4	14.3	7	4.5
Color of lean and fat	-	---	2	14.3	-	---	4	14.3	6	3.8
Thickness	-	---	1	.7	2	11.1	3	10.7	6	3.8
Texture	1	20.0	-	---	3	16.6	2	7.1	6	3.8
Freshness	-	---	1	.7	1	1.1	3	10.7	5	3.2
Trimming of cut	-	---	1	.7	3	16.6	-	---	4	2.5
Little gristle	-	---	-	---	-	---	2	7.1	2	1.3
Little waste	-	---	2	14.3	-	---	-	---	2	1.3
Miscellaneous	2	40.0	3	21.4	-	---	3	10.7	8	5.1
Number of purchases	5		14		18		28		157	100.0

^{1/} Respondents had an opportunity to give more than one reply to the question and for this reason percentages add to more than 100.

mercial grade. Marbling was more important in the case of the Choice and Good grades and of less importance with the Commercial grades. This might be expected, since there was less marbling in the lower grades. Although the size of steak was held as constant as possible, size of cut was mentioned quite frequently as a reason for selecting a particular steak. It is probable that the implication intended by most respondents was that size was satisfactory.

Familiarity with the Wholesale Grades of Beef. Cooperators, when asked what grade of steak they had purchased, used their own terminology to designate grade. (Table 8.) Regardless of what grade they purchased, 24.0 percent thought they had purchased "grade A"—followed by "Choice," "Good" and "Prime," with percentages of 23.1, 16.9, and 15.4, respectively. Other terms used included "top grade," "first class," and "very good." Less than 2 percent stated that they did not know what grade they had purchased. More than one-half of the cooperators who had purchased Prime and Choice grades were unable to apply the proper federal grade term to the cut that they had purchased. In the case of the Good grade, none of those who had purchased Good had identified it while 21.4 percent who had purchased

Even after the terms used by cooperators were translated into what they thought they meant in terms of U. S. grades, many were not able to designate what grade they had actually purchased. With the exception of Choice, the number who correctly related the proper grade term to the meat selected was less than one-fourth of the total. The higher percentage (42.9 percent) of those who said they had purchased Choice may have been due to their acquaintance with the term as a grade term as well as a general term indicating merit. Only 2 of the 18 who purchased Good identified it as Good on the card, while all those who had purchased Commercial suggested that it was a higher grade and 53.6 percent thought it to be equivalent to Choice. (Table 10.)

TABLE 10 -- GRADE OF STEAK PURCHASED AS COMPARED TO WHAT COOPERATORS THOUGHT THEY HAD PURCHASED AFTER SEEING A LIST OF U. S. GRADES.

Grade Presumed Purchased	Grade Actually Purchased							
	Prime		Choice		Good		Commercial	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Prime	1	20.0	3	21.4	4	22.2	8	28.6
Choice	2	40.0	6	42.9	11	61.1	15	53.6
Good	2	40.0	3	21.4	2	11.1	5	17.8
Commercial	-	----	-	----	--	----	--	----
Utility	-	----	-	----	--	----	--	----
Don't know	-	----	2	14.3	1	5.6	--	----
Total	5	100.0	14	100.0	18	100.0	28	100.0

Grades Usually Purchased. Seventy-two percent of the cooperators thought the grades of steak they had purchased were of the same grade as those customarily purchased at their retail stores. Since relatively little of the Prime or the Commercial grade was available at local retail stores, it would be expected that the selections of those cooperating would tend to be for the Good and Choice grades that were available locally. However, when all four grades were made available in the display, there was a tendency to select over the full range of grades with a predominance of Commercial. Therefore, the influence of past experience in purchasing meat at local retail stores probably was minor. Undoubtedly with price as a constant, this removed one of the major criteria used by cooperators in making their selections and may have resulted in some "randomness" in the purchase behavior in the study. It seems evident that, when confronted with the full range of grades, those cooperating were unable to associate grades usually purchased with those available in the study. (Table 11.)

TABLE 11 -- REPLIES TO THE QUESTION, "IS THIS THE GRADE (OF STEAK) YOU USUALLY BUY?"

Replies	Prime		Choice		Good		Commercial	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Yes	4	80.0	10	71.4	13	72.2	20	71.4
No	-	----	4	28.6	5	27.8	6	21.5
Don't know	1	20.0	-	----	-	----	2	7.1
Total	5	100.0	14	100.0	18	100.0	28	100.0

Leanness and Fatness. Nearly half of the cooperators stated that in their opinion the steaks that they had selected from the display were comparable to those usually purchased, as far as leanness and fatness were concerned. Only those who purchased the grades Good and Commercial said they were lean. The proportion of cooperators who considered the steaks they had purchased as lean decreased with the higher grades, while the proportion of those who stated that the steaks they had purchased were fat increased with the higher grades. (Table 12.) Steaks from all grades used in the study were trimmed to a maximum of ½ inch external fat. Differences in fatness of roasts possibly were not as apparent as for steaks. This would indicate an ability on the part of many cooperators to select for leanness or fatness of the steaks.

TABLE 12 -- REPLIES TO THE QUESTION, "DO YOU CONSIDER THIS STEAK TO BE VERY LEAN, LEAN, AVERAGE, OR FAT?"

Reply	Prime		Choice		Good		Commercial	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Very lean	-	----	-	----	4	22.2	6	21.4
Lean	1	20.0	2	14.3	3	16.7	13	46.5
Average	1	20.0	10	71.4	10	55.5	9	32.1
Fat	3	60.0	2	14.3	1	5.6	-	----
Total	5	100.0	14	100.0	18	100.0	28	100.0

Roasts

Modal preferences for roasts were for the lower grades. In the selection of roasts, cooperators tended to select the three lower grades over Prime and purchased almost three times as many of each of the two lower grades as they did of Prime. Sixty-two percent of the roasts selected were of the Commercial and Good grades. Prime roasts accounted for 10.7 percent of the total purchases.

The distribution of roast purchases was less skewed towards the lower grades than that of steak purchases. Cooperators apparently could not evaluate the differences in the amount of fat present on roasts as easily as they could on steaks. (Table 13.)

TABLE 13 -- NUMBER AND PERCENT OF EACH GRADE OF ROAST SELECTED BY COOPERATORS

Grade	Number Purchased	Percent
Prime	8	10.7
Choice	20	26.7
Good	23	30.7
Commercial	24	31.9
Total	75	100.0

Basis for Selection of Roasts. The factors mentioned, in order of frequency, in selecting a particular roast from the display were: amount of fat,

color, and size of the cut; marbling, thickness, amount of bone, and proportion of lean to fat. Some of the factors less frequently mentioned were appearance, flavor, texture, and freshness. (Table 14.)

TABLE 14 -- REASONS, ACCORDING TO GRADE PURCHASED, GIVEN BY COOPERATORS FOR SELECTING A PARTICULAR ROAST FROM THE DISPLAY

Reasons given by Respondents ^{1/}	Grade Purchased								Total Replies	
	Prime		Choice		Good		Commercial			
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Amount of fat	3	37.5	6	30.0	10	43.5	9	37.5	28	16.3
Color, general	1	12.5	4	20.0	9	39.1	7	29.2	21	12.1
Size of cut	4	50.0	4	20.0	5	21.7	6	25.0	19	11.0
Marbling	3	37.5	6	30.0	5	21.7	3	12.5	17	9.8
Thickness & shape of cut	1	12.5	3	15.0	7	30.4	4	16.7	15	8.7
Amount of lean	-	---	3	15.0	5	21.7	4	16.7	12	6.9
Amount of bone	1	12.5	1	5.0	6	26.1	2	8.3	10	5.8
Proportion of lean and fat	-	---	1	5.0	4	17.4	5	20.8	10	5.8
Appearance	-	---	5	25.0	2	8.7	2	8.3	9	5.2
Flavor and taste	-	---	1	5.0	1	4.3	4	16.7	6	3.5
Color of fat and lean	1	12.5	4	20.0	-	---	-	---	5	2.9
Texture	1	12.5	1	5.0	1	4.3	-	---	3	1.7
Freshness	-	---	1	5.0	1	4.3	1	4.2	3	1.7
Trimming and waste	-	---	1	5.0	1	4.3	1	4.2	3	1.7
Most tender	1	12.5	-	---	-	---	2	8.3	3	1.7
Like prime beef	-	---	-	---	-	---	1	4.2	1	.6
Miscellaneous	-	---	5	25.0	2	8.7	1	4.2	8	4.6
Number of purchases	8		20		23		24		173	100.0

^{1/} Respondents had an opportunity to give more than one reply to the question and for this reason percentages add to more than 100.

Marbling was of slightly greater importance to those purchasing the Prime and Choice grades than to those purchasing the two lower grades, Good and Commercial. This would be expected since the higher grades generally carry more marbling. The number of "proportion-of-lean-to-fat" replies decreased in the higher grades. Those selecting the Good and Commercial grades mentioned most frequently the small amount of fat. The attributes describing leanness appeared to be a very important factor in the selections made. Eleven percent of the total replies stated that size of cut was a reason for making selections. It was not possible to maintain the same degree of size uniformity with the roasts as was possible with the steaks.

Determinants of quality were mentioned by all cooperators regardless of the grade selected. It is possible that cooperators purchasing the higher

grades recognized the quality factors associated with finish more than those purchasing the lower grades. However, since cooperators in general purchased the lower grades, apparently greater emphasis was placed on factors such as amount of lean, amount of fat, and proportion of lean to fat. This would indicate they were interested in getting the greatest amount of lean and possibly were willing to sacrifice some of the quality to obtain a larger proportion of lean meat.

Familiarity with Wholesale Grades of Beef. Those purchasing roasts gave a variety of terms when asked the grade of the cut they had selected. Of those purchasing the grades Choice and Good, 30 percent of the cooperators identified them as such. (Table 15.) Here, again cooperators

TABLE 15 -- REPLIES TO THE QUESTION, "WHAT GRADE OF ROAST DO YOU THINK THIS CUT IS?"

Replies	Grade Purchased							
	Prime		Choice		Good		Commercial	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Prime	1	12.5	1	5.0	3	13.0	4	16.6
Choice	2	25.0	6	30.0	4	17.4	7	29.2
Good	2	25.0	2	10.0	7	30.4	3	12.5
Grade A	1	12.5	6	30.0	3	13.0	4	16.6
Grade B	1	12.5	1	5.0	1	4.3	-	----
First grade	1	12.5	1	5.0	2	8.8	-	----
Second grade	-	----	1	5.0	-	----	1	4.2
Very good	-	----	-	----	1	4.3	1	4.2
Top grade	-	----	-	----	-	----	3	12.5
Next to choice down	-	----	-	----	-	----	1	4.2
Medium	-	----	2	10.0	-	----	-	----
Don't know	-	----	-	----	2	8.8	-	----
Total	8	100.0	20	100.0	23	100.0	24	100.0

may have been using the term "choice" not as a grade but rather as a term of merit because of their general familiarity with it. None of the 24 Commercial roasts sold were identified as being Commercial.

When cooperators had translated the grade terms they had used into the U. S. grades, over half indicated that the term which they had used was equivalent to Choice. Only two mentioned that the term which they had used was equivalent to Commercial. It is interesting to note in the case of such terms of "very good," "first grade" and "grade A" the large number of those who associated these terms with the lower grades. As far as they, individually, were concerned the cuts they had selected were the most desirable, yet they suggested the lower U. S. grades as equivalents. It appears that they were not acquainted with the order or ranking of U. S. grade terms. (Table 16.)

A comparison was made between the grade presumed purchased (as translated into U. S. grades) and the grade actually purchased. Three-fourths of those who had purchased Commercial roasts presumed them to be either

TABLE 16 -- REPLIES TO THE QUESTION, "WHAT DOES THE GRADE TERM YOU USED MEAN IN RELATION TO THE REGULAR WHOLESALE GRADE?"

Replies	Federal Wholesale Grade								Total Replies Number
	Prime		Choice		Good		Commercial		
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	
Prime	8	88.9	-	----	1	11.1	-	---	9
Choice	1	5.3	18	94.7	-	---	-	---	19
Good	1	7.1	6	42.9	6	42.9	1	7.1	14
Grade A	2	14.3	9	64.3	3	21.4	-	---	14
Grade B	-	---	1	33.3	2	66.7	-	---	3
First grade	1	25.0	2	50.0	1	25.0	-	---	4
Second grade	-	---	1	50.0	1	50.0	-	---	2
Very good	1	50.0	-	----	-	---	1	50.0	2
Top grade	-	---	3	100.0	-	---	-	---	3
Next to choice down	-	---	1	100.0	-	---	-	---	1
Medium	-	---	2	100.0	-	---	-	---	2
Don't know	-	---	-	----	-	---	2	100.0	2
	14		43		14		4		75

Prime or Choice. One-half of those selecting Prime roasts thought they had purchased Good. However, 80 percent of those selecting Choice indicated that it was such. Selections of cuts made by cooperators presumably were of those which they considered most desirable. Consequently, it is understandable when the terms which they used to describe their choices were translated into U. S. grades it resulted in a general bias. (Table 17.)

TABLE 17 -- GRADE PURCHASED AS COMPARED TO WHAT COOPERATORS THOUGHT THEY HAD PURCHASED AFTER SEEING A LIST OF U. S. GRADES

Grade Presumed Purchased	Grade Actually Purchased							
	Prime		Choice		Good		Commercial	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Prime	1	12.5	2	10.0	5	21.7	4	16.7
Choice	3	37.5	16	80.0	11	47.9	14	58.3
Good	4	50.0	2	10.0	6	26.1	4	16.7
Don't know	-	----	-	----	1	4.3	2	8.3
Total	8	100.0	20	100.0	23	100.0	24	100.0

Grades Usually Purchased. With the exception of Prime, more than 60 percent of the cooperators purchasing roasts said the grade they had purchased was the same as that usually purchased at their stores. Over 70 percent of those selecting the Commercial roasts felt that they were similar to those which they usually purchased. During the interview some indicated that they were unfamiliar with rib roasts. This may have influenced their replies concerning this question. (Table 18.)

TABLE 18 -- REPLIES TO THE QUESTION, "IS THIS THE GRADE (OF ROASTS) YOU USUALLY BUY?"

Replies	Grade							
	Prime		Choice		Good		Commercial	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Yes	4	50.0	13	65.0	14	60.9	17	70.8
No	4	50.0	7	35.0	6	26.1	5	20.8
Don't know	-	----	-	----	3	13.0	2	8.4
Total	8	100.0	20	100.0	23	100.0	24	100.0

Leanness and Fatness. Approximately 50 percent of the cooperators said the roasts they had purchased were average in leanness. There was a general awareness as to the degree of leanness and fatness in the roasts purchased. This was shown by the replies indicating leanness in the lower grades and fatness in the higher grades. Relative leanness was apparently the most important criterion used in selection. (Table 19.)

TABLE 19 -- REPLIES TO THE QUESTION, "DO YOU CONSIDER THIS ROAST TO BE VERY LEAN, LEAN, AVERAGE, FAT, OR VERY FAT?"

Reply	Prime		Choice		Good		Commercial	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Very lean	1	12.5	1	5.0	3	13.0	7	29.2
Lean	2	25.0	7	35.0	8	34.8	9	37.5
Average	4	50.0	10	50.0	12	52.2	7	29.2
Fat	1	12.5	2	10.0	--	----	1	4.1
Very fat	--	----	--	----	--	----	--	----
Total	8	100.0	20	100.0	23	100.0	24	100.0

ANALYSIS OF PREFERENCES AND SATISFACTIONS AFTER COOKING³

Follow-up interviews in the home after consumption of the meat, gave results similar to those obtained at the time of selection as far as grade recognition was concerned. However, a slightly higher percentage of cooperators were able to give the correct identification, particularly those who purchased the Good and Commercial steaks. (Table 20.)

TABLE 20 -- GRADE PURCHASED AS COMPARED TO GRADE PRESUMED PURCHASED, BY COOPERATORS INTERVIEWED IN THE HOME AFTER THE STEAKS AND ROASTS WERE EATEN

Grade Presumed Purchased after seeing card	Grade Purchased							
	Prime		Choice		Good		Commercial	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
	Steaks							
Prime	1	33.3	2	15.4	1	5.9	6	21.4
Choice	1	33.3	7	53.8	9	52.9	11	39.3
Good	1	33.3	4	30.8	4	23.5	8	28.6
Commercial	--	----	--	----	2	11.8	2	7.1
No reply	--	----	--	----	1	5.9	1	3.6
Total	3	100.0	13	100.0	17	100.0	28	100.0
	Roasts							
Prime	2	25.0	5	26.3	2	8.7	3	14.3
Choice	1	12.5	11	57.9	13	56.5	11	52.4
Good	3	37.5	3	15.8	7	30.4	6	28.6
Commercial	2	25.0	--	----	1	4.4	--	----
No reply	--	----	--	----	--	----	1	4.7
Total	8	100.0	19	100.0	23	100.0	21	100.0

³The analysis in this section is based on selected parts of the home interview schedules. Information was obtained on 61 steaks and 71 roasts. In the previous section the analysis was based 65 steak and 75 roast selections. For various reasons it was not possible to obtain home schedules on each of the cuts originally selected.

Cooperators generally liked the steaks and roasts they purchased. All of those who bought steaks of the Prime grade liked them. All but one who purchased Choice steaks said they liked them. But 15.6 percent of those who purchased Good and Commercial steaks did not like them. This suggests that those who purchased the higher grades tended to be better satisfied with their selection than those who purchased the lower grades. Toughness was the main reason given for not liking the lower grades.

Only four out of 75 who purchased roasts indicated that they were unsatisfactory. (Table 21) Each cooperator was asked what he liked about the

TABLE 21 -- REPLIES TO THE QUESTION, "DID YOU LIKE IT?"
BY COOPERATORS INTERVIEWED IN THE HOME AFTER THE
STEAKS AND ROASTS WERE EATEN

Replies Yes or No	Grade							
	Prime		Choice		Good		Commercial	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
	Steaks							
Yes	3	100.0	12	92.3	12	70.6	26	92.9
No	-	----	1	7.7	5	29.4	2	7.1
Total	3	100.0	13	100.0	17	100.0	28	100.0
	Roasts							
Yes	7	87.5	19	100.0	21	91.3	20	95.2
No	1	12.5	--	----	2	8.7	1	4.8
Total	8	100.0	19	100.0	23	100.0	21	100.0

particular cut. Good flavor, tenderness, juiciness, and the right amount of fat were the attributes most frequently mentioned and accounted for more than 90 percent of the total replies. (Table 22) Good flavor was most important among those purchasing the Good and Commercial grades while

TABLE 22 -- REPLIES TO THE QUESTION, "WHAT DID YOU LIKE ABOUT IT?,"
BY COOPERATORS INTERVIEWED IN THE HOME AFTER
THE STEAKS WERE EATEN^{1/}

Replies	Grade Purchased								Total Replies
	Prime		Choice		Good		Commercial		
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	
Good flavor	1	33.3	10	76.9	14	82.4	21	75.0	46
Tender	3	100.0	11	84.6	9	52.9	17	60.7	40
Juicy	-	----	4	30.8	3	17.6	6	21.4	13
Right amount of fat	-	----	1	7.7	3	17.6	6	21.4	10
Fresh	-	----	1	7.7	2	11.8	3	10.7	6
Lots of lean	-	----	-	---	2	11.8	1	3.6	3
Well marbled	-	----	1	7.7	-	---	-	---	1
No waste	-	----	-	---	1	5.9	-	---	1
Other	-	----	1	7.7	2	11.8	1	3.6	4
Number of purchases	3		13		17		28		124

^{1/} Respondents had an opportunity to give more than one reply to the question and for this reason percentages add to more than 100.

tenderness was most important to those selecting Prime and Choice. The higher percentage of those satisfied with the tenderness in the two higher grades over the other grades is noteworthy. In juiciness the lower grades appeared to be satisfactory. The "right" amount of fat was of more importance to those purchasing the lower grades.

When cooperators were asked what they did not like about the steaks purchased, nearly one-half said there was nothing they disliked. (Table 23.)

TABLE 23 -- REPLIES TO THE QUESTION, "WHAT WAS THERE THAT YOU DID NOT LIKE ABOUT IT?", BY COOPERATORS INTERVIEWED IN THE HOME AFTER THE STEAKS WERE EATEN^{1/}

Replies--Dislikes	Grade									
	Prime		Choice		Good		Commercial		Total	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	Replies	
Tough	-	---	1	7.7	6	35.3	7	25.0	14	
Gristly	-	---	-	---	3	17.6	1	3.6	4	
Too much bone	-	---	1	7.7	1	5.9	-	---	2	
Too much fat	1	33.3	4	30.8	-	---	-	---	5	
Stringy, coarse	-	---	-	---	-	---	1	3.6	1	
Did not taste right	-	---	-	---	-	---	2	7.1	2	
Dark color lean	-	---	-	---	-	---	1	3.6	1	
Too thin	1	33.3	1	7.7	1	5.9	-	---	3	
Too dry	-	---	-	---	1	5.9	1	3.6	2	
Other	-	---	-	---	-	---	1	3.6	1	
Not cooked right	-	---	-	---	1	5.9	-	---	1	
Nothing	1	33.3	7	53.8	9	52.9	18	64.3	35	
Number of purchases	3		13		17		28		71	

^{1/} Respondents had an opportunity to give more than one reply to the question.

Of the other replies, toughness in the steaks of the lower grades received major emphasis. None thought Prime steak was tough. However, for the grades Good and Commercial, two-thirds of those indicating a dislike gave terms emphasizing toughness, including "gristly," "stringy" and "tough." Only in the case of Choice and Prime grades was "too fat" mentioned.

The reasons given for liking the roasts were similar to those given for steak. Important attributes desired were good flavor, tenderness, right amount of fat, and juiciness. Other reasons less frequently mentioned were freshness, texture, marbling, "lots of lean," and that it "smelled good."

The most desired attribute in roasts was good flavor. It was mentioned by 89 percent of the purchasers. Tenderness was less frequently mentioned by those purchasing the lower grades. Interpretation of the composite replies suggests that individuals may have different optimum or desired values of the various attributes. For example, "lots of lean" was given by an individual who had selected Choice grade. Although this reply may have been "random" it suggests that individuals may differ widely with respect to the desired degree of a particular attribute and in the ability to discern differences in attributes. (Table 24)

TABLE 24 -- REPLIES TO THE QUESTION, "WHAT DID YOU LIKE ABOUT IT?", BY COOPERATORS INTERVIEWED IN THE HOME AFTER THE ROASTS WERE EATEN^{1/}

Replies	Grade								Total Replies
	Prime		Choice		Good		Commercial		
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	
Good flavor	6	75.0	17	89.5	23	100.0	17	81.0	63
Tender	6	75.0	15	78.9	13	56.5	14	66.7	48
Right amount of fat	1	12.5	7	36.8	11	47.8	7	33.3	26
Juicy	3	37.5	5	26.3	3	13.0	4	19.0	15
Fresh	-	---	1	5.3	2	8.7	4	19.0	7
Well marbled	-	---	2	10.5	1	4.3	1	4.8	4
Smelled good	-	---	-	---	-	---	4	19.0	4
Lots of lean	-	---	1	5.3	-	---	2	9.5	3
Texture	-	---	-	---	-	---	2	9.5	2
No waste	-	---	-	---	-	---	1	4.8	1
Other	-	---	-	---	1	4.3	2	9.5	3
Number of purchases	8		19		23		21		176

^{1/} Respondents had an opportunity to give more than one reply to the question.

Sixty-seven percent of the cooperators purchasing roasts said there was nothing they disliked about them. Two-thirds of those stating dissatisfaction emphasized that the roasts were "tough," "gristly," and "stringy." Thirteen of the 16 who mentioned these dislikes had purchased the Good and Commercial grades. It is interesting to note that too much fat was mentioned in connection with Good and Commercial while "too little fat" was applied to a Choice roast. Inasmuch as attitudes among consumers regarding various attributes cannot be expressed in terms of standardized values, the interpretation of replies must be regarded as tentative. Additional work with a larger sample which includes control of various factors is necessary to give results from which useful generalizations may be made. (Table 25.)

TABLE 25 -- REPLIES TO THE QUESTION, "WHAT WAS THERE THAT YOU DID NOT LIKE ABOUT IT?", BY COOPERATORS INTERVIEWED IN THE HOME AFTER THE ROASTS WERE EATEN^{1/}

Replies--Dislikes	Grades								Replies
	Prime		Choice		Good		Commercial		
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	
Tough	1	12.5	-	---	4	17.4	3	14.3	8
Gristly	-	---	1	5.3	2	8.7	2	9.5	5
Too much bone	-	---	1	5.3	-	---	-	---	1
Too much fat	-	---	-	---	1	4.3	1	4.8	2
Too little fat	-	---	1	5.3	-	---	-	---	1
Stringy, coarse	1	12.5	-	---	-	---	2	9.5	3
Too dry	-	---	1	5.3	1	4.3	-	---	2
Other	1	12.5	-	---	-	---	1	4.8	2
Not cooked right	-	---	-	---	1	4.3	-	---	1
Nothing	5	62.5	16	84.2	17	73.9	13	61.9	51
	8		19		23		21		76

^{1/} Respondents had an opportunity to give more than one reply to the question.

RELATIONSHIP OF INCOME TO PURCHASE BEHAVIOR

Data on income of those participating in the survey was compared to the various factors they used in selecting beef cuts. Information on gross income was obtained by mail questionnaire. Monthly incomes of the 92 individuals participating in the study were classified into groups ranging from less than \$100 to those receiving more than \$500. (Table 26.)

TABLE 26 -- THE NUMBER AND PERCENTAGE OF COOPERATORS WITHIN EACH INCOME GROUP

Income Group Dollars per Month	Cooperators Within Each Group	
	Number	Percent
100 or less	1	1.1
101 to 200	12	13.0
201 to 300	21	22.8
301 to 400	23	25.0
401 to 500	16	17.4
500 and over	19	20.7
Total	92	100.0

Selections of steak and roast by grade showed little if any relationship to income. A comparison of the number of steaks of the different grades purchased within each income group indicated that all income groups purchased a greater number of Good and Commercial steaks than of the other grades. Three-fourths of the steaks purchased by those in the \$501 and over income group were Good and Commercial. In all income groups except the \$201 to \$300, more Commercial grade steaks were selected than Good grade. Cooperators in the income group \$401 to \$500 purchased a smaller proportion of Good and Commercial steaks than did any other income group. (Table 27.) The tendency to select the lower grades was strong in all income groups. This may suggest either a general lack of knowledge of meat factors or preferences which have little relation to present grade standards.

TABLE 27 -- THE NUMBER AND PERCENT OF EACH GRADE OF STEAK SELECTED BY INCOME GROUPS

Income Group	Grade								Total Number
	Prime		Choice		Good		Commercial		
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	
100 or less	-	---	-	---	1	100.0	-	---	1
101 to 200	1	12.5	2	25.0	2	25.0	3	37.5	8
201 to 300	2	15.4	1	7.7	6	46.1	4	30.8	13
301 to 400	-	---	4	28.6	3	21.4	7	50.0	14
401 to 500	1	7.7	4	30.8	3	23.1	5	38.4	13
501 and over	1	6.2	3	18.8	3	18.8	9	56.2	16
Total	5		14		18		28		65

The relationship of income to grade of roasts was similar to that of steaks. In the selection and purchase of roasts, cooperators with incomes in the modal income group (\$301 to \$400) indicated a preference for the grades Good and Commercial with a slight preference for Good and Com-

mercial. Purchases by the highest income group were greatest in the Choice grades. All other income groups concentrated their purchases in the Good and Commercial grades. With the lower income group (\$201 to \$300) a preference was shown for the Good grade of roast. This was the same grade preferred in steaks by this group, showing a consistency in their selections. (Table 28.)

TABLE 28 -- THE NUMBER AND PERCENT OF EACH GRADE OF ROAST SELECTED BY INCOME GROUPS

Income Group	Grade								Total Number
	Prime		Choice		Good		Commercial		
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	
100 or less	-	---	-	---	-	---	1	100.0	1
101 to 200	3	33.3	1	11.1	2	22.2	3	33.3	9
201 to 300	-	---	6	35.3	7	41.2	4	23.5	17
301 to 400	2	9.1	2	9.1	10	45.4	8	36.4	22
401 to 500	1	10.0	3	30.0	2	20.0	4	40.0	10
501 and over	2	12.5	8	50.0	2	12.5	4	25.0	16
Total	8		20		23		24		75

Great care should be exercised in making interpretations of the relationship of income to purchase behavior by grades. The particular retail cuts used in the display may not have been familiar to all those participating. Consequently, some may have made selections more or less randomly. The size and the nature of the sample preclude any broad generalizations. It is likely that the percentage of professional people within each income group was higher than in most other cities of the same size. Another factor that undoubtedly influenced selection is that a high proportion of those participating used home freezers or were locker plant patrons and hence were more accustomed to buying meat in quantity or carcass units and therefore were not as familiar with retail selection.

STATED PREFERENCES FOR THE SELECTED PHYSICAL CHARACTERISTICS OF BEEF

A portion of the interview schedule was devoted to obtaining the general opinions and reasons for preferences with respect to certain physical characteristics of beef. In the analysis, no attempt was made to relate the replies of individuals to the grade that they had purchased. Free response type questions were used in order to elicit more fully the reasons held for the various preferences.

When cooperators were asked what "things" they looked for in meat which indicated quality to them, a wide variety of replies were given. Factors indicating quality to the cooperators in order of importance were color, amount of fat, marbling, amount of bone and color of lean. These factors accounted for nearly two-thirds of the total replies. A few of the factors less

frequently mentioned were texture, color of fat, freshness, age of animal, and "no muscle tissue."⁴ (Table 29.)

TABLE 29 -- REPLIES TO THE QUESTION, "WHAT THINGS DO YOU LOOK FOR IN BEEF WHICH INDICATE QUALITY TO YOU?"

Replies	Number	Percent
Marbling	29	11.8
Color of lean	19	7.8
Color of fat	7	2.9
Amount of fat	38	15.4
Color	49	19.9
Size	2	.8
Without white breaks	1	.4
No muscle tissue	1	.4
Amount of bone	27	11.0
Texture	12	4.9
Grade	3	1.2
Grain	3	1.2
Solid bone	2	.8
Shape of cut	4	1.6
Amount of lean	5	2.0
Appearance	8	3.3
Freshness	5	2.4
Proportion of lean to fat	9	3.7
Trimming	4	1.6
Color of lean and fat	7	2.9
Cartilage and gristle	3	1.2
Kind of cut	2	.8
Condition of bone	1	.4
Less waste	1	.4
Age of animal	2	.8
Tenderness	1	.4
Total	245	100.0

On the basis of total number of replies given, cooperators indicated a preference for creamy white fat, followed by white and then creamy with percentages of 31.5, 27.2, and 18.5, respectively. (Table 30.)

TABLE 30 -- REPLIES TO THE QUESTION, "WHAT COLOR OF FAT DO YOU LIKE?"

Replies	Number	Percent
White	25	27.2
Creamy white	29	31.5
Creamy	17	18.5
Slightly yellow	12	13.0
Yellow	1	1.1
Very yellow	1	1.1
Other	7	7.6
Total	92	100.0

⁴This respondent when questioned as to what he meant by "no muscle tissue" replied "not enough of this white stuff, whatever you call it." He was referring to the fat portion as muscle tissue.

Replies as to why cooperators preferred a particular color of fat tended to emphasize freshness, appearance, and taste. In general, these replies were given by those indicating a preference for creamy white and white. The replies given were the cooperators' ideas of why they indicated a preference for a particular color of fat. Some reasons given may be neither relevant nor associated with color. (Table 31.)

TABLE 31 -- REASONS GIVEN BY COOPERATORS FOR PREFERRING A PARTICULAR COLOR OF FAT^{1/}

Reasons	Creamy		Slightly		Very		Total	Percent
	White	White Creamy	Yellow	Yellow	Yellow	Yellow		
Corn fed animal	-	-	-	3	-	-	3	3.3
More healthful	1	-	2	1	-	-	4	4.4
If darker would be old	-	2	1	-	-	-	3	3.3
Looks cleaner	1	1	-	-	-	-	2	2.2
Younger beef	-	3	-	-	-	-	3	3.3
Appetizing appearance	2	4	1	1	-	-	8	8.8
Better taste	2	2	1	1	-	1	7	7.7
An indication of age	2	-	1	1	-	1	5	5.5
Indicates finish of animal	1	1	1	-	-	-	3	3.3
Indicates freshness	4	4	1	-	-	-	9	9.8
Advice of man who knew	-	2	-	-	-	-	2	2.2
Not likely to be dairy breed	4	-	1	-	-	-	5	5.5
Not rancid	2	-	-	1	-	-	3	3.3
Better flavor	-	2	2	1	-	-	5	5.5
Looks more natural	-	1	1	-	-	-	2	2.2
More tender	1	1	-	1	-	-	3	3.3
Better grade or quality	3	2	1	-	-	-	6	6.6
Yellow too rich	-	1	1	-	-	-	2	2.2
Indicates proper feeding	2	2	1	1	1	-	7	7.7
Miscellaneous	1	4	1	3	-	-	9	9.9
Total	26	32	16	14	1	2	91	100.0
Don't know							12	

^{1/} Respondents had an opportunity to give more than one reply to the question.

Modal preferences for color of lean were for the medium red color. Nearly one-third of those cooperating preferred the bright red color. Seventy-six percent of the respondents indicated a preference for these colors. (Table 32.) However, when the cooperators were asked to give the equivalent color paddle reading there were wide variations in paddle readings for any given color.⁵ For example, the range in equivalent color paddle scale for the medium red was from one through eight, while bright red ranged from one through nine. Forty percent of those who preferred medium red

⁵Meat Scale A, Color Paddle, manufactured by Munsell Color Company. Scale ranged from 1 through 10.

TABLE 32 -- COLOR OF LEAN PREFERRED BY COOPERATORS

Replies	Number	Percent
Light red	15	16.3
Medium red	40	43.5
Bright red	30	32.6
Dark red	4	4.3
Other	3	3.3
Total	92	100.0

considered it equivalent to a color paddle reading of three while 27 percent of those who preferred bright red also chose scale reading of three as equivalent. These wide ranges in equivalent color paddle readings to verbal color terms suggest that part of the differences may be due to differences in visual perception among individuals. Furthermore, the subjective terms used may not have been in the proper order or rank. Reliance on verbal terms designating color alone would likely result in meaningless interpretation. (Table 33.)

TABLE 33 -- SUBJECTIVE LEAN COLOR TERMS ASSOCIATED WITH MUNSELL COLOR READINGS BY COOPERATORS

Color Paddle Number	Color of Lean									
	Light Red		Medium Red		Bright Red		Dark Red		Other	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
1	5	33.3	3	7.5	7	23.3	-	----	-	----
2	4	26.7	3	7.5	4	13.3	-	----	2	66.7
3	2	13.3	16	40.0	8	26.7	-	----	-	----
4	3	20.0	7	17.5	2	6.7	-	----	1	33.3
5	-	----	3	7.5	2	6.7	1	25.0	-	----
6	1	6.7	5	12.5	1	3.3	-	----	-	----
7	-	----	1	2.5	3	10.0	2	50.0	-	----
8	-	----	2	5.0	-	----	1	25.0	-	----
9	-	----	-	----	1	3.3	-	----	-	----
No reply	-	----	-	----	2	6.7	-	----	-	----
Total	15	100.0	40	100.0	30	100.0	4	100.0	3	100.0

Color of lean was associated with freshness more than with any other factor. Nine percent felt that color indicated the age of the animal from which the carcass was derived. As in the case of color of fat, some of the reasons for preferring a particular color of lean appear to be irrelevant. Yet, to the respondents, these reasons may have been important. (Table 34.)

Seventy-six percent of the respondents indicated that they looked for marbling in beef. The remainder stated that they did not. Nearly 30 percent of those who looked for marbling in beef felt that it was an indication of tenderness. Flavor accounted for 14 percent of the replies. A number of the replies given were very similar to "quality" and "better taste" was equivalent to better flavor. The wide variety of replies given is an indication of the lack of a common interpretation and usage of terms in describing characteristics of meat. (Table 35.)

TABLE 34 -- REPLIES TO THE QUESTION, "WHY DO YOU PREFER THIS PARTICULAR COLOR OF LEAN?"^{1/}

Replies	Color of Lean					Total No.	Percent
	Light Red	Medium Red	Bright Red	Dark Red	Other		
Feeding and breeding	-	-	2	-	-	2	1.7
Indicates tenderness	2	-	-	-	-	2	1.7
Indicates freshness	6	21	20	-	1	48	39.5
Younger animal	1	-	1	-	-	2	1.7
Appearance	2	3	2	-	1	8	6.6
Better	1	2	1	-	-	4	3.3
Indicates quality	-	2	-	1	-	3	2.5
Indicates health of animal	-	3	-	-	-	3	2.5
Looks good	-	1	1	-	-	2	1.7
Better flavor	-	3	-	-	-	3	2.5
Proven best in past	1	-	2	-	1	4	3.3
If animal bled well, will have light color	1	2	-	-	-	3	2.5
Properly cured	1	-	-	1	-	2	1.7
Dark color doesn't look good	1	1	-	-	-	2	1.7
Looks more or less appetizing	2	4	-	-	-	6	5.0
Age of animal	2	2	4	2	1	11	9.1
Older animal	-	2	-	-	-	2	1.7
Don't know	1	3	2	1	-	7	5.7
Miscellaneous	1	3	2	-	-	6	4.8
No reply	-	-	1	-	-	1	.8
						121	100.0

^{1/} Respondents were given opportunity to give more than one reply.

TABLE 35 -- REPLIES TO QUESTION, "WHY DO YOU LOOK FOR WHITE FLECKS?"^{1/}

Replies	Number	Percent
Indicates feeding	12	13.2
Indicates tenderness	27	29.6
Better flavor	13	14.3
More juicy	4	4.4
Better taste	2	2.2
Indicates better meat	9	9.9
Indicates fatness	2	2.2
Indicates quality	3	3.3
Indifferent	4	4.4
Better cooking	4	4.4
Indicates texture	2	2.2
Better appearance	3	3.3
Likes lean meat	3	3.3
Miscellaneous	3	3.3
Total	91	100.0

^{1/} Replies of 70 respondents who indicated they did look for marbling. They were permitted to give more than one reason.

It is apparent that the terms used have different meanings among individuals when describing the desired degree of color of lean or fat and other characteristics of meat. This fact has significance in analysis of preferences for beef. The data presented in this section merely show the range and the nature of problems involved in obtaining the preferences for various physical characteristics of beef. No attempt has been made to determine the relative weight or importance of individual characteristics of beef. Color of lean may or may not be the most important characteristic which consumers consider in meat selection. Conceivably, the relative importance of each may vary with income and other characteristics of the consumer. A different approach would be required to answer these questions. It is clear, however, that determination of preferences solely on the basis of expressed preferences of the several physical characteristics of beef fails to recognize the many other considerations involved in preferences.

PURCHASE BEHAVIOR THROUGH TIME

As indicated previously, it was impossible to maintain the original sample over the four weeks period. Had the entire original sample remained intact over the course of the four interviews, considerable information would have been obtained on the effect of repeated participation of the same co-operators. It was possible to observe the purchase behavior and identification of grade of only seven persons on both steaks and roasts.⁶

Emphasis was placed on evaluating reasons for purchase behavior and ability of consumers to recognize various criteria used in meat selection. Observations over time gave a partial clue as to stability of and the reasons given for purchase behavior. Some respondents may have developed a more critical attitude toward the same questions as the study progressed. Several cooperator asked whether or not they had given the "correct" answer indicating that they felt they must give the "approved" answer.

TABLE 36 -- THE NUMBER OF STEAKS AND ROASTS SELECTED BY SEVEN COOPERATORS, BY WEEKS, MARCH AND APRIL, 1952

Date	Prime	Choice	Good	Commercial
<u>Steaks</u>				
March 14	-	-	3	4
March 21	1	1	2	3
March 28	2	-	-	5
April 4	3	1	1	2
<u>Roasts</u>				
March 14	-	2	2	3
March 21	-	2	3	2
March 28	-	3	2	2
April 4	1	3	2	1

⁶Four persons purchased both steaks and roasts on each of the four dates.

Selection and Identification Through Time. There appeared to be a slight shift in the latter weeks from the lower grades toward the higher grades of steaks. In the case of roasts, the selections tended to be concentrated in the Choice, Good and Commercial grades throughout the period. Only one Prime roast was purchased. (Table 36.)

Selections of most individuals varied by grade throughout the period. However, when the total change or shift between grades for each individual was computed the selections were fairly stable. Six of the seven who purchased steaks made total grade shifts of two positions⁷ or less. In the case of roasts the grade shifts among three individuals were three or larger. The total number of grade shifts for both steaks and roast were the same. (Table 37.)

TABLE 37 -- GRADE OF STEAK AND ROASTS SELECTED BY COOPERATORS BY DATE, MARCH AND APRIL, 1952

Cooperator Number	March 14	March 21	March 28	April 4	Total Grade Shifts ^{1/}
<u>Steaks</u>					
1	Commercial	Choice	Commercial	Prime	7
2	Commercial	Commercial	Commercial	Commercial	0
3	Commercial	Good	Commercial	Commercial	2
4	Good	Commercial	Commercial	Good	2
5	Commercial	Commercial	Commercial	Choice	2
6	Good	Good	Prime	Prime	2
7	Good	Prime	Prime	Prime	2
					17
<u>Roasts</u>					
1	Good	Choice	Good	Choice	3
2	Commercial	Good	Good	Commercial	2
3	Good	Good	Good	Good	0
4	Choice	Commercial	Choice	Good	5
5	Choice	Choice	Choice	Choice	0
6	Commercial	Commercial	Commercial	Choice	2
7	Choice	Choice	Commercial	Prime	5
					17

^{1/} Computed as a change in selections from the initial choice to subsequent selections. For example, in the case of cooperator 1, Commercial to Choice was a shift of 2 grades, from Choice to Commercial 2, and from Commercial to Prime 3 or a total of 7.

The instability of choice of some of the cooperators through time as compared with their initial choice does not necessarily indicate that they lacked sufficient knowledge to make consistent selections. Conceivably, they may have altered their selections from the previous time for a particular purpose. They may have deliberately chosen a grade that they felt might better

⁷ Computed as a change in selections from the initial grade selection to subsequent selections.

serve, for example, the needs of weekend guests. In other words, they may not choose to satisfy their own preferences in every instance, but rather those of others. Complicating the whole matter of choice is whether the person making the choice is representing his own preferences or the composite preferences of his family. Some may have been deliberately experimenting in selections since the opportunity was afforded them. Others may have had no preference between grades. There remains the strong possibility that a large share of the instability in choice arises from lack of sufficient knowledge of meat characteristics by grade and their association with desired satisfactions. (See Appendix for detail of replies of respondents.)

A comparison was made of accuracy in the identification of grades selected both at the time of purchase and again after cooking. An analysis of whether or not the cooperators improved their identification as the study progressed was made. It was felt that the possibility existed that participation over time would tend to increase the proportion of proper identification of grade. It should be mentioned that a "learning situation" was deliberately avoided in the design of the study. Reinterviews could have engendered an interest in some in "learning" more about meat selection and also could have introduced new terms to them. Undoubtedly, some of those cooperating did consult with their butcher concerning matters of meat selection.

The analysis of the shifts in pattern of identification⁸ can be regarded as tentative in view of the relatively small sample. Nonetheless, there is evidence that there was no improvement over time in ability to identify grades even when expressed terminology was translated into U. S. grade terms. (Table 38.) The direction of the errors consistently appeared to be in one direction, that is, grade of cut was identified as higher than the actual grade. Total error in identification in steaks remained about the same with visual selection and after cooking. The total error in roasts increased substantially when identification was made after cooking. The number of errors in the downward direction tended to increase with identifications after cooking, suggesting that a more critical evaluation of grade was possible after cooking.

Most of the explained variation in patterns of identification arose from variations between individuals. The variation between dates was not significant. Furthermore, there was no significant difference in identification at time of visual selection and identification after cooking. Concerning the explained variation due to difference among individuals, only tentative reasons can be suggested for differences, most of which have been referred to above. (Table 39.) While care was exercised to maintain as uniform a dis-

⁸Error in grade identification was computed in terms of the number and direction. For example, cooperator 1 chose Commercial steak on March 14 and identified it as Choice. Error in this instance was computed as ± 2 . On April 4, this cooperator purchased a Prime steak but identified it as Choice. Error in this instance was -1 .

TABLE 38 -- NUMBER AND DIRECTION OF ERRORS OF COOPERATORS IN IDENTIFICATION OF STEAKS AND ROASTS, BY DATES, MARCH AND APRIL, 1952

Date	Cooperator							Sum of Errors
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
<u>Steaks at time of purchase</u>								
March 14	+2	+2	+2	+1	+1	0	+1	9
March 21	+1	+3	+1	+2	+1	0	-1	9
March 28	+2	+2	+2	+1	+1	-1	0	9
April 4	-1	+2	+2	+1	0	0	-1	7
Sum	6	9	7	5	3	1	3	34
<u>After Cooking</u>								
March 14	+3	0	+3	0	+2	0	-1	9
March 21	+1	+2	+1	+1	0	+1	-1	7
March 28	+2	-1	+2	+1	0	-2	-1	9
April 4	-1	-1	+2	0	-1	-1	0	6
Sum	7	4	8	2	3	4	3	31
<u>Roasts at time of purchase</u>								
March 14	+1	+1	0	0	0	+3	+2	7
March 21	0	0	0	+1	0	+3	0	4
March 28	+2	0	+1	-1	0	+2	+2	8
April 4	0	+1	+1	0	0	+1	0	3
Sum	3	2	2	2	0	9	4	22
<u>After Cooking</u>								
March 14	+2	+2	+1	-1	0	+3	+2	11
March 21	0	+1	+1	+1	-1	+3	-1	8
March 28	+2	0	+1	-1	0	+2	+2	8
April 4	+1	+2	+1	+1	0	0	0	5
Sum	5	5	4	4	1	8	5	32

TABLE 39 -- ANALYSIS OF SOURCE OF VARIATION IN IDENTIFICATION OF GRADES, STEAKS AND ROASTS, MARCH AND APRIL, 1952

Source of Variation	Actual F/Ratio	Degrees of Freedom	Significance ^{1/}
<u>Steaks</u>			
<u>Visual Selection</u>			
Between individuals	6.632	6	**
Between dates	5.063	3	
<u>After Cooking</u>			
Between individuals	2.660	6	*
Between dates	.686	3	
<u>Roasts</u>			
<u>Visual Selection</u>			
Between individuals	3.638	6	*
Between dates	1.446	3	
<u>After Cooking</u>			
Between individuals	1.552	6	
Between dates	1.242	3	

^{1/} **Significant at 1 percent level

*Significant at 5 percent level

play of meat as possible within and between grades, this was not always possible. Part of the variation may have been from this source.

Stability of Indicated Preferences for Various Physical Attributes. The interview schedule contained a section in which information was obtained concerning various physical attributes. The questions were not oriented toward the particular cut they had selected but toward obtaining the respondents' general preferences for color of fat and lean and degree of marbling and the reasons for those preferences.

With respect to color of lean and color of fat, there was no apparent shift in the group between the preferences indicated in the initial and the last interviews. One person stated he did not know which color he preferred. Only three persons gave the same reply on all four dates. The others changed their reply one or more times. The performance through time, with regard to color of lean, was much the same. Four persons gave consistent replies, that is, used the same term on all four dates. (Table 40.)

TABLE 40 -- NUMBER OF CHANGES IN REPLIES IN SUBSEQUENT INTERVIEWS FROM THAT GIVEN BY RESPONDENTS IN INITIAL INTERVIEW

Cooperators Number	Color of Fat	Color of Lean
1	3	0
2	1/	0
3	2	3
4	1	0
5	2	0
6	2	2
7	0	2
8	1	0
9	0	1
10	0	3
11	2	2

1/ Replied "Didn't know" on the four dates.

Terms describing the various attributes are highly subjective and have different meanings among persons using them. Some of the individuals interviewed were introduced to the terms used in the study for the first time and felt compelled to indicate a preference. Few could be expected to order or rank the colors in the scale frequently used in describing degree of color in fat or lean. An effort was made to determine the association of the color of lean term used with the Munsell color scale reading.⁵ Each person was asked to select the color reading equivalent to the subjective term he used.

It was quite evident that the various color terms used to describe lean color varied considerably. "Medium red" ranged from a reading of two through six on the scale. (Table 41.) "Bright red" was considered equivalent to a range of from one through seven on the scale. This comparison against a standard suggests that great care should be exercised in the use of subjective terms in description of lean color. The disparity between the descrip-

⁵See footnote, p. 25.

TABLE 41 -- SUBJECTIVE LEAN COLOR TERMS ASSOCIATED WITH MUNSELL COLOR READINGS BY COOPERATORS

Munsell Color Paddle Number	Color of Lean			
	Light Red	Medium Red	Bright Red	Dark Red
1	0	0	6	0
2	0	3	8	0
3	0	8	0	0
4	1	1	1	3
5	0	1	1	0
6	0	3	0	0
7	0	0	2	2
8	0	0	0	3
9	0	0	0	1
10	0	0	0	0
Total	1	16	18	9

tive terms used to describe color by a group of individuals and a color standard is likely to be great.

Apparently, the degree of marbling had relatively little meaning to the cooperators. Four of the 11 replying shifted their replies during the course of the four dates. One person consistently stated she did not look for marbling. Others in giving reasons why they looked for marbling gave replies indicating that they did not know why but felt it must be important since the question was asked. (Table 42.)

TABLE 42 -- REPLIES TO THE QUESTION, "DO YOU LOOK FOR WHITE FLECKS (MARBLING)?", ON FOUR DATES, MARCH AND APRIL, 1952

Cooperator Number	Number of Replies	
	Yes	No
1	1 ^{1/}	3
2	4	0
3	0	4
4	4	0
5	1 ^{1/}	3
6	2 ^{2/}	2
7	4	0
8	4	0
9	3	1 ^{3/}
10	4	0
11	4	0

^{1/} This reply given on last date.

^{2/} This reply given on second and last date.

^{3/} This reply given on third date.

The reasons given by cooperators for preferences for a particular degree of an attribute varied considerably over the four dates and sometimes had little relevance. This would suggest that "notions" about various attributes are very lightly held. Also, that many undoubtedly had been introduced for the first time to the differentiating visual characteristics of meat and there-

fore felt that they must be important. This may have induced them to reply and resulted in some inconsistency of the replies.

Eating Satisfaction as Related to Grade Selections. Preferences, to be meaningful, must assume that the selection of the desired "grade" of a particular cut of meat is associated with satisfactions resulting from eating it. In the problem of determining consumer preference one cannot overlook the matter of satisfaction resulting from consumption. It was suggested earlier that consumers may not be able to identify the grade of the selections made. Furthermore, choices may appear to be somewhat random.

The task of associating the desired eating satisfactions of beef to apparent visual physical attributes of beef in the store counter is a formidable one for most consumers. Experience over time might indicate to some that marbling (in the technologists' sense) is associated with tenderness and that color of fat has little importance in indicating eating satisfactions. But most consumers are relatively infrequent purchasers of many cuts of beef. Each cut is in reality a different commodity.

Aside from the difficulty (even for "experts") of associating desired eating satisfactions with visual characteristics of meat as a guide in selection, there remains another complicating aspect. Method of meat preparation for the table undoubtedly affects eating satisfactions. A particular grade of steak, for example, can be prepared with varying degrees of skill and result in different degrees of satisfaction when consumed by the same person. Use of cooking methods not adapted to the grade or type of cut may result in dissatisfactions. In this case, the inherent qualities of a particular grade of beef may be of considerable consequence in obtaining ultimate satisfaction.

Cooking methods used for steaks varied between cooperators. Some used moist heat while others did not. The length of frying or broiling period varied. One cooperator reported frying a Prime steak 30 minutes, yet the same person stated that a Commercial steak was fried for 10 minutes. The Prime steak was "medium done" while the Commercial was reported as being "well done." Similar apparent variation existed also in the methods used for roasts. For both steaks and roasts there appeared to be a wide range in cooking methods which resulted in the same reported degree of "doneness." Undoubtedly, "well done," a subjective term, had different meanings among cooperators.

All persons selecting roasts indicated that "they liked" them. Dissatisfaction was reported on eight of the 28 steaks and these were primarily with the Commercial grade. However, when asked if there was anything they disliked about the cut, cooperators who purchased the lower grades of steak, mentioned toughness, while those who purchased the higher grades, mentioned too much fat. One indicated that the Commercial steak was "too fat." Only six replies concerning dislikes on roasts were reported. This suggests the possibility that a wider range in preference exists in the case of

roasts, that is, more than one grade would serve equally well. Preferences, also, may not be as "specific" in the case of steaks. (Table 43.)

TABLE 43 -- NUMBER OF "LIKES" AND "DISLIKES" BY COOPERATORS AFTER STEAKS AND ROASTS WERE EATEN

Replies	Grade Purchased				Total
	Prime	Choice	Good	Commercial	
	<u>Steaks (Liked)</u>				
Yes	6	1	4	9	20
No	0	1	2	5	8
	<u>Steaks (Disliked)</u>				
Nothing	3	1	2	8	14
Too thin	2	0	1	0	3
Too fat	2	2	0	1	5
Tough	0	0	3	3	6
	<u>Roasts (Liked)</u>				
Yes	1	10	9	8	28
No	0	0	0	0	0
	<u>Roasts (Disliked)</u>				
Nothing	1	6	8	7	22
Too thin	0	1	0	0	1
Too fat	0	2	0	0	2
Poor flavor	0	1	0	0	1
Tough	0	0	1	0	1
Too dry	0	0	0	1	1

The inconsistency of replies and selections over time poses several important difficulties in the analysis of consumer preferences. It suggests a lack of sufficient knowledge on the part of some consumers to enable them to make choices that would result in maximum satisfaction. Yet many indicated they were satisfied with the results. What constitutes "maximum satisfaction" remains a problem and probably must be defined in relation to alternative "grades" available to consumers. The alternative grades available to consumers in the study were much more numerous than in their usual retail meat outlets. Furthermore, the removal of price as a variable eliminated a "clue" in the selection process. The experimental situation may have introduced an aspect of unreality and contributed to the apparent inconsistencies noted. It should be recognized that most consumers probably have only a vague concept as to what constitutes a desirable degree of tenderness, flavor or juiciness. Furthermore, the preference scale even among those who have a reasonable degree of familiarity, is likely to be different. That the attitudes concerning various attributes expressed by the cooperators are relative rather than in terms of a standardized scale should be kept in mind. In essence then, there is no desirable degree of these attributes for most consumers. In addition, other factors undoubtedly enter into the evalu-

ation of attributes. Several that might be mentioned include, differences in acuteness of sensory abilities among individuals, methods of cooking, and the effect of the other foods served. Also, it is not known whether the evaluation of attributes was exclusively that of the person interviewed or represented a composite evaluation of those persons eating the particular meat.

In the determination of consumer preferences, a large number of variables are involved which influence preferences. Most important is that preferences among individuals are different. Failure to recognize these factors can result in incorrect conclusions with respect to consumer preferences.

SUMMARY

The objectives of this study were: (1) to evaluate consumer preference for degree of finish of beef; (2) to ascertain the important factors which consumers use in selecting beef; (3) to relate preference at time of purchase to preference after eating; and (4) to relate consumer income to beef preferences.

The data for this study were collected during March and April, 1952, from a sample of consumers in Columbia, Mo. For various reasons some of the consumers, particularly those of lower income groups, did not participate. Consumers selected cuts of rib steaks and rib roasts from a display on each of the four sale dates. There were 92 individual cooperators participating in the study. Much of the analysis was based on data from persons participating only once or, for those participating more than once, using the data obtained in their initial appearance. An analysis based on data obtained from the cooperators who participated on all four dates of the study was also made.

The majority of consumers participating in the study preferred the lower grades of rib steaks and rib roasts. In the selection of steaks, the modal preference was for the Commercial grade. Cooperators tended to select the three lower grades of roasts over Prime with a slight preference for Commercial over the grades Good and Choice.

Amount of fat, color, and marbling were the attributes most frequently mentioned by cooperators as the reason for selecting a particular steak, while amount of fat, color, size of cut, and marbling were mentioned most frequently as the reasons for the selection of roasts.

Most of the cooperators thought the grades of steak and roast purchased during the study were the same as those customarily purchased at their retail stores. When asked what grade they had purchased, cooperators, in general, used a wide variety of terms that they were later unable to associate with regular U. S. grade terms.

There was an awareness on the part of many cooperators as to the degree of leanness and fatness of the steaks and roasts purchased. This was indicated in the predominance of replies indicating leanness in the lower grades and fatness in the higher grades.

Selection of the grade of steaks and roasts by cooperators did not show definite pattern in relation to income. All income groups purchased a greater number of the low than of the high grades of steaks and roasts.

The study indicated that there was no improvement over time in the ability of cooperators to identify grades. There was little difference in ability to identify by visual observation and ability to identify after cooking of the steaks. However, with roasts, there was evidence that more critical evaluation of grade was possible after cooking.

Factors indicating quality to cooperators, in order of importance, were color, amount of fat, marbling, amount of bone, and color of the lean.

Cooperators indicated a preference for creamy white colored fat, followed by white and then creamy. Freshness, appearance, and taste were the reasons most frequently mentioned for preferring a particular color. The predominant preference was for medium red color of lean, followed by bright red and light red. Freshness was most frequently mentioned as the reason for preferring a particular color of lean. Many of the cooperators indicated they looked for marbling in the beef purchased with their reasons for doing so being that it was an indication of tenderness and good flavor.

CONCLUSIONS

Since this study was pilot scale in scope and the methodology was being developed, the following conclusions are strictly tentative.

1. When cuts of the full range of grades are offered at equal prices, a majority of consumers tend to select cuts of the lower grades of beef.
2. Many consumers are not acquainted with the differentiating grade characteristics of beef as they appear in the retail cut.
3. Most consumers are not able to evaluate the relative importance of the various visual physical characteristics of beef in terms of eating satisfaction.
4. A majority of consumers are not acquainted with the U. S. grade terms for beef or the ordering or ranking of these terms.
5. Further research on consumer preferences for beef should recognize special problems in methodology. These include:
 - a. Problem in interpretation of replies of consumers with respect to their preferences, particularly of those who have relatively little acquaintance with beef.
 - b. Preferences by grade are likely to be confounded by preferences for various retail cuts.
 - c. Problems of physical and organoleptic variability within grades of beef cuts.
 - d. Research should be extended to larger populations to verify findings.

APPENDIX

COOPERATOR NUMBER 1, STEAKS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Commercial	Choice	Commercial	Prime
Reason for selection	Little fat	Liked color	Little fat	Good color
Grade thought it was	Grade A	Prime	Choice	Choice
Meaning in U.S. grade	Choice	Prime	Choice	Choice
Color of fat liked	Creamy	Creamy white	Creamy	Creamy white
Why?	Looks healthier	Better grade	Looks healthier	Yellow indicates dairy animal
Color of lean liked	Medium red	Medium red	Medium red	Medium red
Why?	Looks better, fresher	Dark doesn't look good & better than bright red	Dark doesn't look healthy	Dark indicates an old animal. Med. red is more appetizing
Color paddle reading	4	3	3	2
Look for marbling	No	No	No	Yes
Why or why not?	Don't know	Look only for larger portion	Doesn't mean anything to me	Indicates tender meat
	<u>Replies after Cooking</u>			
Grade thought it was	Highest	Prime	Choice	Choice
Meaning in U.S. grade	Prime	Prime	Choice	Choice
Did you like it?	Yes	Yes	Yes	Yes
What liked about it	Tender, good flavor, juicy	Tender, good flavor, juicy	Tender, good flavor, juicy	Tender, good flavor, juicy
What not liked about it	Nothing	Nothing	Too much fat	Too much fat
How prepared	Fried	Fried	Fried	Fried
How long cooked	10 minutes	10-15 minutes	15 minutes	30 minutes
What temperature	Medium	Low	Low	Low
How done was it	Well done	Well done	Well done	Medium

COOPERATOR NUMBER 2, STEAKS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Commercial	Commercial	Commercial	Commercial
Reason for selection	Size, color, little fat, marbling	Thicker, fat darker than rest, marbling	Color, size marbling	Color, size absence of fat
Grade thought it was	Prime	Choice	Choice	Choice
Meaning in U.S. grade	Choice	Prime	Choice	Choice
Color of fat liked	Don't know	Don't know	Don't know	Don't know
Why?				
Color of lean liked	Dark red	Dark red	Dark red	Dark red
Why?	Indicates aged beef	Sign of aged meat	Indicates age	Indicates age of meat
Color paddle reading	7	8	7	8
Look for marbling	Yes	Yes	No	No
Why or why not?	Better flavor	Indicates good quality	Was told it was good	More tender, better flavor
	<u>Replies after Cooking</u>			
Grade thought it was	Poor	Choice	Utility	Utility
Meaning in U.S. grade	Commercial	Choice	Utility	Utility
Did you like it?	No	Yes	No	No
What liked about it	Nothing	Tender, good flavor, juicy	Nothing	Nothing
What not liked about it	Tough, didn't taste right	Too thin	Tough, didn't taste right, no flavor	Tough, didn't taste right, no flavor
How prepared	Oven broiled	Oven broiled	Oven broiled	Oven broiled
How long cooked	10 minutes	10 minutes	10 minutes	10 minutes
What temperature	Don't know	Don't know	Don't know	Don't know
How done was it	Rare	Rare	Medium	Rare

COOPERATOR NUMBER 3, STEAKS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Commercial	Good	Commercial	Commercial
Reason for selection	Good flesh, little bone	Evenness of fat, fine texture	Right amt. of fat and lean, good texture	Distribution of fat, little bone
Grade thought it was	A	Choice	Choice	Choice
Meaning in U.S. grade	Choice	Choice	Choice	Choice
Color of fat liked	Creamy	Creamy white	Creamy white	White
Why?	Looks nicer	Think it is better	Think it is the best	Indicates freshness and quality
Color of lean liked	Medium red	Bright red	Medium red	Bright red
Why?	Don't know	Indicates freshness	Indicates freshness	Indicates freshness
Color paddle reading	3	2	2	2
Look for marbling	No	No	No	No
Why or why not?	No comment	Don't know	Don't know how	Not familiar with it
	<u>Replies after Cooking</u>			
Grade thought it was	Choice	Choice	Choice	Choice
Meaning in U.S. grade	Prime	Choice	Choice	Choice
Did you like it?	Yes	Yes	Yes	Yes
What liked about it	Tender, good flavor, right amt. of fat	Tender, Juicy	Tender, good flavor, juicy	Tender, good flavor, juicy
What not liked about it	Nothing	Nothing	Nothing	Nothing
How prepared	Oven broiled	Fried it	Fried it	Oven broiled
How long cooked	15 minutes	16 minutes	20 minutes	18 minutes
What temperature	Medium	Don't know	Medium	Broil
How done was it	Medium	Medium	Well done	Medium

COOPERATOR NUMBER 4, STEAKS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Good	Commercial	Commercial	Good
Reason for selection	Marbling, color	Not too much fat, color	Not too much bone, color marbling	Marbling
Grade thought it was	A	Choice	Good	Good
Meaning in U.S. grade	Choice	Choice	Good	Choice
Color of fat liked	Creamy	Creamy	Creamy white	Creamy
Why?	Don't know	Don't know	Richer appearance	Indicates richness
Color of lean liked	Bright red	Bright red	Bright red	Bright red
Why?	Indicates freshness	Indicates freshness	Indicates freshness	Fresher
Color paddle reading	(1) no choice	1	1	2
Look for marbling	Yes	Yes	Yes	Yes
Why or why not?	More tender	More tender	Indicates tenderness	More tender
	<u>Replies after Cooking</u>			
Grade thought it was	Good	Good	Best steak ever had	Good
Meaning in U.S. grade	Good	Good	Good	Good
Did you like it?	Yes	Yes	Yes	Yes
What liked about it	Tender	Tender	Tender	Tender, good flavor
What not liked about it	Gristly	Nothing	Nothing	Nothing
How prepared	Oven broiled	Oven broiled	Oven broiled	Oven broiled
How long cooked	20 minutes	17 minutes	18 minutes	15 minutes
What temperature	Don't know	Broil	Broil	Don't know
How done was it	Medium	Medium	Rare	Rare

COOPERATOR NUMBER 5, STEAKS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Commercial	Commercial	Commercial	Choice
Reason for selection	Husband wanted fat size	Lot of lean	Because it had some fat	Fat through it Little gristle
Grade thought it was	Very good	Good	Good	Good
Meaning in U.S. grade	Good	Good	Good	Choice
Color of fat liked	Don't know	Creamy fat	Creamy white	White
Why?		Indicates well fed animal, aged	Looks fresher	Taste of it
Color of lean liked	Medium red	Medium red	Medium red	Medium red
Why?	Looks better	Looks better	Looks fresher	Indicates younger animal
Color paddle reading	3	3	3	3
Look for marbling	No	No	No	Yes
Why or why not?	Don't know	Butcher doesn't give time	Not enough time	More tender meat
	<u>Replies after Cooking</u>			
Grade thought it was	Choice	Commercial	Commercial	Good
Meaning in U.S. grade	Choice	Commercial	Commercial	Good
Did you like it?	Yes	Yes	Yes	Yes
What liked about it	Tender, good flavor, right amt. of fat	Tender, good flavor	Tender, good flavor	Good flavor, texture
What not liked about it	Nothing	Too much fat	Nothing	Nothing
How prepared	Oven broiled	Pan broiled	Oven broiled	Oven broiled
How long cooked	15 minutes	20 minutes	10 minutes	15 minutes
What temperature	Don't know	Low	Broil	Broil
How done was it	Medium	Medium	Medium	Medium

COOPERATOR NUMBER 6, STEAKS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Good	Good	Prime	Prime
Reason for selection	Large enough tenderness	Prime	Biggest for least price	Size, color
Grade thought it was	Don't know	Good	Choice	Prime
Meaning in U.S. grade	Good	Good	Choice	Prime
Color of fat liked	Creamy	Creamy white	Creamy	Creamy
Why?	Better flavor	Don't know	Like that color	Don't know
Color of lean liked	Bright red	Bright red	Dark red	Bright red
Why?	Tastes better	Dark color is spoiled	Indicates aging	Don't know
Color paddle reading	7	5	9	7
Look for marbling	No	Yes	No	Yes
Why or why not?	Want lean	Have heard indicates better meat	Don't know what talking about	Gives flavor
	<u>Replies after Cooking</u>			
Grade thought it was	Don't know	Don't know	Good	Choice
Meaning in U.S. grade	Good	Choice	Good	Choice
Did you like it?	No	Yes	Yes	Yes
What liked about it	Flavor	Tender	Tender, flavor	Tender, good flavor
What not liked about it	Tough, too dry	Nothing	Nothing	Too much fat
How prepared	Oven broiled	Oven broiled	Oven broiled	Oven broiled
How long cooked	20 minutes	15 minutes	15 minutes	15 minutes
What temperature	High (400°)	High	High	Broil
How done was it	Over done	Well done	Well done	Well done

COOPERATOR NUMBER 7, STEAKS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Good	Prime	Prime	Prime
Reason for selection	Well trimmed Looked good	Looked good Well marbled	Looked best Marbling of fat	Good marbling
Grade thought it was	Best	Choice	Top grade	Choice
Meaning in U.S. grade	Choice	Choice	Prime	Choice
Color of fat liked	Creamy white	Creamy white	Creamy white	Creamy white
Why?	No reason	Don't know	Look better	Don't know
Color of lean liked	Medium red	Bright red	Medium red	Medium red
Why?	Dark color may be spoiled	Looks better Dark looks old	Indicates medium age	Not too old, not too fresh
Color paddle reading	3	4	6	6
Look for marbling	Yes	Yes	Yes	Yes
Why or why not?	Good beef	Means good meat	Have been told to	Indicates tenderness
	<u>Replies after Cooking</u>			
Grade thought it was	Not too good	Choice	Choice	Prime
Meaning in U.S. grade	Commercial	Choice	Choice	Prime
Did you like it?	No	Yes	Yes	Yes
What liked about it	Good flavor	Tender and good flavor	Tender and good flavor	Tender good flavor
What not liked about it	Tough, too thin	Too thin	Nothing	Too thin
How prepared	Oven broiled	Oven broiled	Oven broiled	Pan broiled
How long cooked	20 minutes	16 minutes	12 minutes	12 minutes
What temperature	Don't know	Don't know	High	Medium
How done was it	Well done	Well done	Well done	Well done

COOPERATOR NUMBER 1, ROASTS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Good	Good	Choice	Choice
Reason for selection	Right size, little fat and bone	Like color, not too much fat or bone	Good color, not too much fat	Color, little fat, well distributed fat
Grade thought it was	Choice	Prime	Choice	Choice
Meaning in U.S. Grade	Choice	Prime	Choice	Choice
Color of fat liked	Creamy	Creamy white	Creamy	Creamy white
Why?	Looks better	Looks like best grade	Looks healthier	Yellow indicates dairy animal
Color of lean liked	Medium red	Medium red	Medium red	Medium red
Why?	Looks fresher, better	Looks better	Looks better	Looks better, Dark indicates older animal
Color paddle reading	4	3	3	2
Look for marbling	No	No	No	Yes
Why or why not?	Don't know	Look only for large amt. of fat	Doesn't care	Indicates tender meat
	<u>Replies after Cooking</u>			
Grade thought it was	Best	Prime	Choice	Prime
Meaning in U.S. grade	Prime	Prime	Choice	Prime
Did you like it?	Yes	Yes	Yes	Yes
What liked about it	Tender, good flavor, right amt. of fat	Tender, good flavor	Tender, good flavor	Tender good flavor, juicy
What not liked about it	Nothing	Too much fat	Nothing	Nothing
How prepared	Roasted	Roasted	Roasted	Roasted
How long cooked	30 minutes	3 hours	30 minutes	3 hours
What temperature	250°(Low)	300°(Low)	250°(Low)	250°(Low)
How done was it	Well done	Well done	Well done	Well done

COOPERATOR NUMBER 2, ROASTS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Commercial	Good	Good	Commercial
Reason for selection	Marbling, color, cut with grain	Not too much fat, color, marbling	Not too much bone, color, marbling	More lean, looks good
Grade thought it was	A	Good	Good	Good
Meaning in U.S. grade	Good	Good	Good	Good
Color of fat liked	Creamy	Creamy	Creamy white	Creamy
Why?	Don't know	Don't know	Richer appearance	Indicates richness
Color of lean liked	Bright red	Bright red	Bright red	Bright red
Why?	Indicates freshness	Indicates freshness	Indicates freshness	Freshness
Color paddle reading	2	1	1	2
Look for marbling	Yes	Yes	Yes	Yes
Why or why not?	More tender	More tender	Indicates tenderness	More tender
	<u>Replies after Cooking</u>			
Grade thought it was	Very good	Choice	Good	Choice
Meaning in U.S. grade	Choice	Choice	Good	Choice
Did you like it?	Yes	Yes	Yes	Yes
What liked about it	Tender, good flavor	Tender, Juicy	Tender, good flavor	Tender, good flavor, lots of lean
What not liked about it	Nothing	Nothing	Gristly	Too dry
How prepared	Pan broiled	Broiled	Roasted	Roasted
How long cooked	3 hours	3 hrs. 15 min.	3 hours	3 hrs. 30 min.
What temperature	Low	300°(Low)	Low	Low
How done was it	Medium	Well done	Well done	Well done

COOPERATOR NUMBER 3, ROASTS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Good	Good	Good	Good
Reason for selection	Leanness, color, well trimmed	More lean, right thickness	More lean than other	Best one, color, small bone
Grade thought it was	Good	Good	Choice	Choice
Meaning in U.S. grade	Good	Good	Choice	Choice
Color of fat liked	White	Creamy white	Creamy white	Creamy white
Why?	Indication of age	Indicates quality	Indicates quality	Indicates quality
Color of lean liked	Bright red	Bright red	Bright red	Bright red
Why?	Indicates age of carcass and freshness	Shows quality & tenderness	Indicates freshness	Indicates quality and age
Color paddle reading	3	3	3	3
Look for marbling	Yes	Yes	Yes	Yes
Why or why not?	Indicates quality	Indicates well fed, young animal	Indicates quality	Indicates quality
	<u>Replies after Cooking</u>			
Grade thought it was	Good	Choice	Good	Choice
Meaning in U.S. grade	Choice	Choice	Choice	Choice
Did you like it?	Yes	Yes	Yes	Yes
What liked about it	Tender, good flavor, right amt. of fat	Good flavor, right amt. of fat	Tender, good flavor	Tender, good flavor
What not liked about it	Nothing	Nothing	Nothing	Nothing
How prepared	Roasted	Roasted	Roasted	Roasted
How long cooked	2 hours	2 hrs. 30 min.	3 hours	4 hours
What temperature	325°(Low)	325°(Medium)	325°(Low)	325°(Low)
How done was it	Well done	Well done	Well done	Well done

COOPERATOR NUMBER 4, ROASTS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Choice	Commercial	Choice	Good
Reason for selection	Looked good, color, nice size, fresh	Large, color lean, small amt. of waste	Shaped neatly flavor, tender	Size, color, amt. of fat
Grade thought it was	A	Good	Good	Good
Meaning in U.S. grade	Choice	Good	Good	Good
Color of fat liked	Creamy	Creamy	Creamy	Creamy white
Why?	Beef not too old	Indicates well fed animal	Indicates age of animal, better flavor	Indicates age, better quality animal
Color of lean liked	Dark red	Dark red	Dark red	Bright red
Why?	Shows age of beef and freshness	Shows freshness, not dry	Better flavor texture is good	Shows age of meat and freshness
Color paddle reading	4	4	4	2
Look for marbling	Yes	Yes	No	Yes
Why or why not?	Indicates tenderness	Indicates tenderness	It has no meaning	Indicates tender, and juicy roast
	<u>Replies after Cooking</u>			
Grade thought it was	Good	Good	Good	Choice
Meaning in U.S. grade	Good	Good	Good	Choice
Did you like it?	Yes	Yes	Yes	Yes
What liked about it	Tender, good flavor	Tender, good flavor	Good flavor, juicy	Tender, good flavor
What not liked about it	Nothing	Nothing	Too much fat	Nothing
How prepared	Roasted	Roasted	Roasted	Roasted
How long cooked	2 hr. 30 min.	2 hours	2 hours	2 hours
What temperature	325 ^o (Low)	325 ^o (Low)	325 ^o (Low)	300 ^o (Low)
How done was it	Medium	Medium	Medium	Well done

COOPERATOR NUMBER 5, ROASTS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Choice	Choice	Choice	Choice
Reason for selection	Marbling	Color, lean texture of fat and amt.	Color, marbling	Color, size, marbling
Grade thought it was	Medium	Choice	Choice	Choice
Meaning in U.S. grade	Choice	Choice	Choice	Choice
Color of fat liked	White	White	White	White
Why?	Never rancid	Fat is not rancid	Not rancid	Not rancid or strong
Color of lean liked	Dark red	Medium red	Medium red	Light red
Why?	Better aged	Better cured Light color indicates young beef	Properly cured beef	Indicates tenderness
Color paddle reading	8	5	6	4
Look for marbling	Yes	Yes	Yes	Yes
Why or why not?	More tender	Seems better	Better taste	Indicates better
	<u>Replies after Cooking</u>			
Grade thought it was	Good	Good	Choice	Choice
Meaning in U.S. grade	Choice	Good	Choice	Choice
Did you like it?	Yes	Yes	Yes	Yes
What liked about it	Flavor, amt. of fat	Tender	Tender, good flavor	Tender, good flavor, juicy
What not liked about it	Nothing	Didn't taste right	Nothing	Nothing
How prepared	Roasted	Roasted	Roasted	Roasted
How long cooked	2 hrs. 30 min.	2 hrs. 30 min.	3 hours	2 hrs. 45 min.
What temperature	250 ^o (Low)	250 ^o (Low)	250 ^o (Low)	250 ^o (Low)
How done was it	Medium	Medium	Well done	Well done

COOPERATOR NUMBER 6, ROASTS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Commercial	Commercial	Commercial	Choice
Reason for selection	Color, fat enough to cook	Marbling, good color, fresh	Marbling of fat, color, fine grain	Amt. of fat, color, marbling
Grade thought it was	Prime	Prime	Choice	Prime
Meaning in U.S. grade	Prime	Prime	Choice	Prime
Color of fat liked	White	Creamy white	White	White
Why?	Don't know	Yellow might not be good	Tastes better	Yellow means a strong taste
Color of lean liked	Bright red	Bright red	Medium red	Bright red
Why?	Proves freshness	Indicates freshness	Looks fresh	Indicates freshness
Color paddle reading	1	1	2	1
Look for marbling	Yes	Yes	Yes	Yes
Why or why not?	Better grade	Meat is better	Juicier meat, flavor better	Better flavor
	<u>Replies after Cooking</u>			
Grade thought it was	Prime	Prime	Choice	Choice
Meaning in U.S. grade	Prime	Prime	Choice	Choice
Did you like it?	Yes	Yes	Yes	Yes
What liked about it	Tender, right amt. of fat	Tender, right amt. of fat	Tender, good flavor, right amt. of fat	Tender, good flavor
What not liked about it	Nothing	Nothing	Nothing	Nothing
How prepared	Roasted	Roasted	Roasted	Roasted
How long cooked	4 hours	4 hours	3 hrs. 30 min.	3 hrs. 30 min.
What temperature	325°(Low)	325°(Low)	250°(Low)	250°(Low)
How done was it	Medium	Medium	Medium	Medium

COOPERATOR NUMBER 7, ROASTS

Item or Reply	Date			
	March 14	March 21	March 28	April 4
	<u>Replies after Selection</u>			
Grade actually purchased	Commercial	Choice	Commercial	Prime
Reason for selection	Looked better	Well marbled, some fat	Size, more economical	Best grade, size, looked good
Grade thought it was	Choice	Choice	Choice	Prime
Meaning in U.S. grade	Choice	Choice	Choice	Prime
Color of fat liked	Creamy white	Creamy white	Creamy white	Creamy white
Why?	No reason	Don't know	Looks more attractive	Don't know
Color of lean liked	Medium red	Bright red	Medium red	Medium red
Why?	Don't know	Anemic looking if pale, old if dark	Indicates age (medium age)	Not old, not too fresh
Color paddle reading	4	4	6	6
Look for marbling	Yes	Yes	Yes	Yes
Why or why not?	Don't know	Good meat	Have been told	Indicates tenderness
	<u>Replies after Cooking</u>			
Grade thought it was	Pretty good	Good	Choice	Prime
Meaning in U.S. grade	Choice	Good	Choice	Prime
Did you like it?	Yes	Yes	Yes	Yes
What liked about it	Tender, good flavor, right amt. of fat	Tender, good flavor	Tender, good flavor	Tender, good flavor, juicy
What not liked about it	Nothing	Too thin	Nothing	Nothing
How prepared	Roasted	Roasted	Roasted	Roasted
How long cooked	2 hrs. 45 min.	2 hrs. 30 min.	2 hrs. 45 min.	3 hours
What temperature	350°	350°	350°	325°
How done was it	Well done	Well done	Well done	Well done